FIG.1

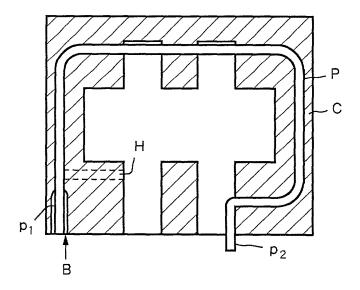


FIG.2

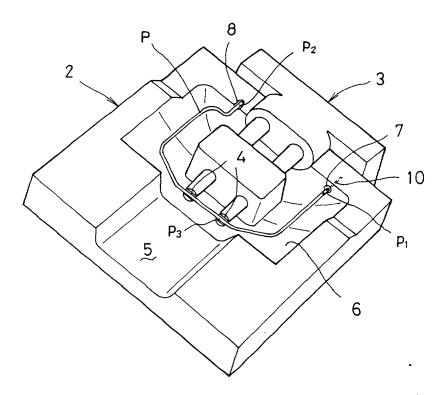


FIG.3

FIG.4A FIG.4B FIG.4C

10

10

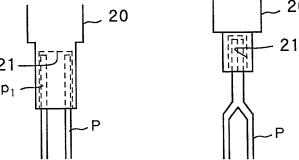
P1

FIG.5

10



 $\dot{p_1}$ 



# FIG.7A

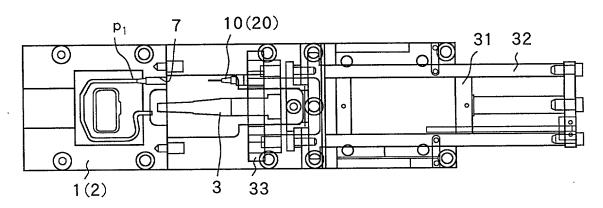


FIG.7B

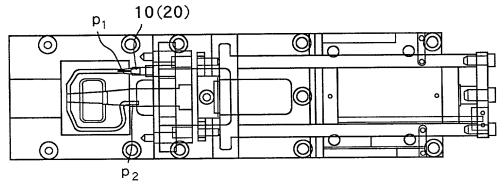


FIG.7C

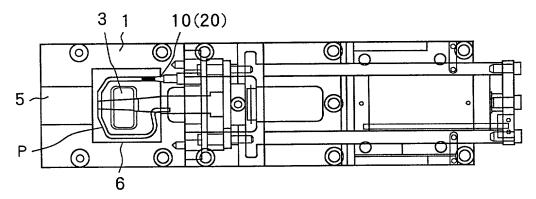


FIG.8

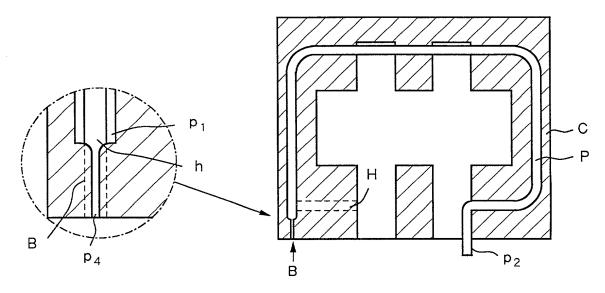


FIG.9

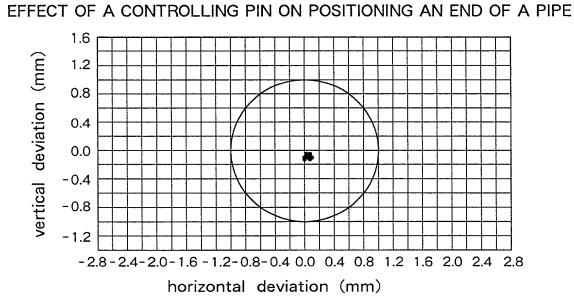
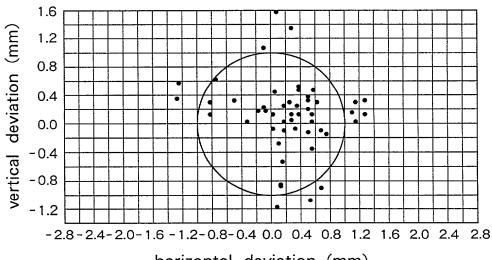


FIG.10

## DISLOCATION OF AN END OF A PIPE WITHOUT USE OF A CONTROLLING PIN



horizontal deviation (mm)